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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/748,256	12/27/2000	Howard H. Chen	YO999-153DIV	4783

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MCGINN & GIBB, PLLC  
8321 OLD COURTHOUSE ROAD  
SUITE 200  
VIENNA, VA 22182-3817

EXAMINER

NADAV, ORI

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 12/04/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/748,256

Applicant(s)

CHEN ET AL.

Examiner

ori nadav

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-- Th MAILING DATE of this communication appears on th cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 29-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

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## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 40 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The text of the specification recites using a SiGe epitaxial process to form islands with SiGe. There is no support in the text of the specification for a device comprising a bulk silicon region and a crystallized SiGe formed on the bulk silicon, as recited in claim 40, in such a way as to enable one skilled in the art to which it pertains, or to make and/or use the device

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***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 29-45, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Witek et al. (6,146,970).

Witek et al. teach in figure 14 a substrate for mixed logic and memory applications comprising a bulk silicon region, and an SOI region (column 6, lines 9-10) comprising an insulator layer formed in a single crystal silicon, an amorphous silicon layer 206 (column 6, lines 23-25) formed over the oxide layer, and islands of crystal silicon form STI's 210 formed at predetermined locations to remove defects on the SOI region, wherein a memory device is positioned in the bulk silicon region.

Regarding the processing limitations of forming a crystalized silicon layer by annealing amorphous silicon, and crystalizing the amorphous silicon using an exposed portion of the silicon as a seed and using STI's to remove defects on the SOI region, as recited in claims 29, 41, 45, 40 and 32, these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). Therefore, the claimed structure is considered to be in at least obvious over Witek et al.' structure.

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Regarding claims 35 and 41, Witek et al. teach in figure 22 a planarized upper surface of the STI's, the substrate and the silicon layer. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to planarize the upper surface of the device of figure 14 in order to improve the processing steps of the device.

Regarding claim 36, Witek et al. teach a crystal silicon having a crystal orientation which follows an underlying substrate, because the two materials are identical.

Regarding claims 38-39, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to form various types of memory and logic devices on the silicon bulk of Witek et al.'s device in order to use the device in a particular application.

Regarding claim 40, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use SiGe on insulator instead of Si on insulator in Witek et al.'s device, because it is conventional to substitute SiGe material for Si. Note Chen et al. and Tsuchiaki are cited to support the well known position.

5. Claims 29-45, insofar as in compliance with 35 U.S.C. 112, rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (5,767,549).

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Regarding claim 40, Chen et al. teach in figure 1 a substrate for mixed logic and memory applications comprising a bulk silicon region, and an SOI region 14 comprising a single crystal silicon, an SiGe layer 18 (column 2, line 65) formed over the oxide layer, and islands of crystal silicon form STI's 38 formed at predetermined locations to remove defects on the SOI region, wherein a memory device is positioned in the bulk silicon region.

Regarding the processing limitations of forming a crystalized silicon layer by annealing amorphous silicon, crystalizing the amorphous silicon using an exposed portion of the silicon as a seed and using STI's to remove defects on the SOI region as recited in claims 29, 41, 45, 40 and 32, these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). Therefore, the claimed structure is considered to be in at least obvious over Chen et al.' structure.

Regarding claims 29, 41 and 45, although Chen et al. do not teach an amorphous silicon layer formed on the silicon substrate, this is a processing limitation, since the amorphous silicon layer is later converted to crystal silicon.

Regarding claims 35 and 41, Chen et al. teach a planarized upper surface of the STI's, the substrate and the silicon layer.

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Regarding claim 36, Chen et al. teach a crystal silicon having a crystal orientation which follows an underlying substrate, because the two materials are identical.

Regarding claims 38-39, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to form various types of memory and logic devices on the silicon bulk of Chen et al.'s device in order to use the device in a particular application.

6. Claims 29-45, insofar as in compliance with 35 U.S.C. 112, rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiaki (6,051,509).

Regarding claim 40, Tsuchiaki teaches in figure 6b a substrate for mixed logic and memory applications comprising a bulk silicon region, and an SOI region comprising a single crystal silicon, an SiGe layer (column 21, line 17) formed over the oxide layer, and STI's 201 formed at predetermined locations to remove defects on the SOI region, wherein the SiGe layer is at least partially positioned on a bulk region of the substrate and the SOI portion of the substrate.

Regarding the processing limitations of forming a crystalized silicon layer by annealing amorphous silicon, crystalizing the amorphous silicon using an exposed portion of the silicon as a seed and using STI's to remove defects on the SOI region as recited in claims 29, 41, 45, 40 and 32, these would not carry patentable weight in this claim

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drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). Therefore, the claimed structure is considered to be in at least obvious over Tsuchiaki's structure.

Regarding claims 29, 41 and 45, although Tsuchiaki does not teach an amorphous silicon layer formed on the silicon substrate, this is a processing limitation, since the amorphous silicon layer is later converted to crystal silicon.

Regarding claims 35 and 41, Tsuchiaki teaches a planarized upper surface of the STI's, the substrate and the silicon layer.

Regarding claim 36, Tsuchiaki teaches a crystal silicon having a crystal orientation which follows an underlying substrate, because the two materials are identical.

Regarding claims 38-39, it would have been obvious to a person of ordinary skill in the art at the time the invention was made form various types of memory and logic devices on the silicon bulk of is positioned in the bulk silicon region of Tsuchiaki's device in order to use the device in a particular application.



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***Response to Arguments***

7. Applicant argues on page 7 that prior art does not teach a device comprising a bulk silicon and SOI.

An SOI is formed by providing an insulator layer in a bulk silicon substrate. Therefore, an SOI device comprises a bulk silicon. Applicant does not claim a bulk silicon substrate comprising an SOI portion and a second portion free of an SOI, such that no insulator layer is present between the bottom and top surfaces of the bulk silicon.

8. The rest of applicant's arguments with respect to claims 29-45 were adequately addressed in previous office action (paper 7).

**Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722**

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**and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.**

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 3 PM (Eastern Standard Time) Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached at **(703) 308-2772**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

Ori Nadav

December 1, 2001

Steven Locke  
Primary Examiner

A handwritten signature in cursive script that reads "Steven Locke".